

CLAIMS

What is claimed is:

1 1. A method comprising:
 2 receiving a line of text, the line of text having a set of ordered characters;
 3 flipping the characters of the line of text about a display axis;
 4 identifying a set of runs of foreign characters in the line of text; and
 5 flipping the characters of the runs of the set of runs of foreign characters within
 6 each run of foreign characters.

1 2. The method of claim 1 further comprising:
 2 receiving a block of text;
 3 breaking the block of text into a set of lines of text; and
 4 performing the receiving the line of text, flipping the characters of the line,
 5 identifying and flipping the characters of the runs for each line of text of the set of lines
 6 of text.

1 3. The method of claim 2 further comprising:
 2 passing the line of text to a native operating system for display.

1 4. The method of claim 1 wherein:
2 the text is received from an application with no capability of handling bi-
3 directional text.

1 5. The method of claim 1 wherein:
2 the foreign text is defined as text which should be displayed in a left-to-right
3 fashion.

1 6. The method of claim 1 wherein:
2 the foreign text is defined as text which should be displayed in a right-to-left
3 fashion.

1 7. A machine-readable medium embodying instructions, which, when executed
2 by a processor, cause the processor to perform a method, the method comprising:
3 receiving a line of text, the line of text having a set of ordered characters;
4 flipping the characters of the line of text about a display axis;
5 identifying a set of runs of foreign characters in the line of text; and
6 flipping the characters of the runs of the set of runs of foreign characters within
7 each run of foreign characters.

1 8. The machine readable medium of claim 7 further embodying instructions
2 which when executed by a processor, cause the processor to perform the method
3 further comprising:
4 receiving a block of text;
5 breaking the block of text into a set of lines of text; and
6 performing the receiving the line of text, flipping the characters of the line,
7 identifying and flipping the characters of the runs for each line of text of the set of lines
8 of text.

1 9. The machine readable medium of claim 7 further embodying instructions
2 which when executed by a processor, cause the processor to perform the method
3 further comprising:
4 passing the line of text to a native operating system for display.

1 10. A processor which executes instructions causing the processor to perform
2 the method comprising:
3 receiving a line of text, the line of text having a set of ordered characters;
4 flipping the characters of the line of text about a display axis;
5 identifying a set of runs of foreign characters in the line of text; and
6 flipping the characters of the runs of the set of runs of foreign characters within
7 each run of foreign characters.

1 11. The processor of claim 10 wherein the method further comprises:
2 receiving a block of text;
3 breaking the block of text into a set of lines of text; and
4 performing the receiving the line of text, flipping the characters of the line,
5 identifying and flipping the characters of the runs for each line of text of the set of lines
6 of text.

1 12. The processor of claim 11 wherein the method further comprises:
2 passing the line of text to a native operating system for display.

1 13. A server configured to send instructions to a remote client, to configure the
2 remote client to perform the method comprising:

3 receiving a line of text, the line of text having a set of ordered characters;
4 flipping the characters of the line of text about a display axis;
5 identifying a set of runs of foreign characters in the line of text; and
6 flipping the characters of the runs of the set of runs of foreign characters within
7 each run of foreign characters.

1 14. The server of claim 13 wherein the server is configured to send instructions
2 to the client to configure the client to perform the method further comprising:
3 receiving a block of text;
4 breaking the block of text into a set of lines of text; and
5 performing the receiving the line of text, flipping the characters of the line,
6 identifying and flipping the characters of the runs for each line of text of the set of lines
7 of text.

112345678910111213141516171819202122232425262728293031323334353637383940414243444546474849505152535455565758596061626364656667686970717273747576777879808182838485868788899091929394959697989910010110210310410510610710810911011111211311411511611711811912012112212312412512612712812913013113213313413513613713813914014114214314414514614714814915015115215315415515615715815916016116216316416516616716816917017117217317417517617717817918018118218318418518618718818919019119219319419519619719819920020120220320420520620720820921021121221321421521621721821922022122222322422522622722822923023123223323423523623723823924024124224324424524624724824925025125225325425525625725825926026126226326426526626726826927027127227327427527627727827928028128228328428528628728828929029129229329429529629729829930030130230330430530630730830931031131231331431531631731831932032132232332432532632732832933033133233333433533633733833934034134234334434534634734834935035135235335435535635735835936036136236336436536636736836937037137237337437537637737837938038138238338438538638738838939039139239339439539639739839940040140240340440540640740840941041141241341441541641741841942042142242342442542642742842943043143243343443543643743843944044144244344444544644744844945045145245345445545645745845946046146246346446546646746846947047147247347447547647747847948048148248348448548648748848949049149249349449549649749849950050150250350450550650750850951051151251351451551651751851952052152252352452552652752852953053153253353453553653753853954054154254354454554654754854955055155255355455555655755855956056156256356456556656756856957057157257357457557657757857958058158258358458558658758858959059159259359459559659759859960060160260360460560660760860961061161261361461561661761861962062162262362462562662762862963063163263363463563663763863964064164264364464564664764864965065165265365465565665765865966066166266366466566666766866967067167267367467567667767867968068168268368468568668768868969069169269369469569669769869970070170270370470570670770870971071171271371471571671771871972072172272372472572672772872973073173273373473573673773873974074174274374474574674774874975075175275375475575675775875976076176276376476576676776876977077177277377477577677777877978078178278378478578678778878979079179279379479579679779879980080180280380480580680780880981081181281381481581681781881982082182282382482582682782882983083183283383483583683783883984084184284384484584684784884985085185285385485585685785885986086186286386486586686786886987087187287387487587687787887988088188288388488588688788888989089189289389489589689789889990090190290390490590690790890991091191291391491591691791891992092192292392492592692792892993093193293393493593693793893994094194294394494594694794894995095195295395495595695795895996096196296396496596696796896997097197297397497597697797897998098198298398498598698798898999099199299399499599699799899910001001100210031004100510061007100810091010101110121013101410151016101710181019102010211022102310241025102610271028102910301031103210331034103510361037103810391040104110421043104410451046104710481049105010511052105310541055105610571058105910601061106210631064106510661067106810691070107110721073107410751076107710781079108010811082108310841085108610871088108910901091109210931094109510961097109810991100110111021103110411051106110711081109111011111112111311141115111611171118111911201121112211231124112511261127112811291130113111321133113411351136113711381139114011411142114311441145114611471148114911501151115211531154115511561157115811591160116111621163116411651166116711681169117011711172117311741175117611771178117911801181118211831184118511861187118811891190119111921193119411951196119711981199120012011202120312041205120612071208120912101211121212131214121512161217121812191220122112221223122412251226122712281229123012311232123312341235123612371238123912401241124212431244124512461247124812491250125112521253125412551256125712581259126012611262126312641265126612671268126912701271127212731274127512761277127812791280128112821283128412851286128712881289129012911292129312941295129612971298129913001301130213031304130513061307130813091310131113121313131413151316131713181319132013211322132313241325132613271328132913301331133213331334133513361337133813391340134113421343134413451346134713481349135013511352135313541355135613571358135913601361136213631364136513661367136813691370137113721373137413751376137713781379138013811382138313841385138613871388138913901391139213931394139513961397139813991400140114021403140414051406140714081409141014111412141314141415141614171418141914201421142214231424142514261427142814291430143114321433143414351436143714381439144014411442144314441445144614471448144914501451145214531454145514561457145814591460146114621463146414651466146714681469147014711472147314741475147614771478147914801481148214831484148514861487148814891490149114921493149414951496149714981499150015011502150315041505150615071508150915101511151215131514151515161517151815191520152115221523152415251526152715281529153015311532153315341535153615371538153915401541154215431544154515461547154815491550155115521553155415551556155715581559156015611562156315641565156615671568156915701571157215731574157515761577157815791580158115821583158415851586158715881589159015911592159315941595159615971598159916001601160216031604160516061607160816091610161116121613161416151616161716181619162016211622162316241625162616271628162916301631163216331634163516361637163816391640164116421643164416451646164716481649165016511652165316541655165616571658165916601661166216631664166516661667166816691670167116721673167416751676167716781679168016811682168316841685168616871688168916901691169216931694169516961697169816991700170117021703170417051706170717081709171017111712171317141715171617171718171917201721172217231724172517261727172817291730173117321733173417351736173717381739174017411742174317441745174617471748174917501751175217531754175517561757175817591760176117621763176417651766176717681769177017711772177317741775177617771778177917801781178217831784178517861787178817891790179117921793179417951796179717981799180018011802180318041805180618071808180918101811181218131814181518161817181818191820182118221823182418251826182718281829183018311832183318341835183618371838183918401841184218431844184518461847184818491850185118521853185418551856185718581859186018611862186318641865186618671868186918701871187218731874187518761877187818791880188118821883188418851886188718881889189018911892189318941895189618971898189919001901190219031904190519061907190819091910191119121913191419151916191719181919192019211922192319241925192619271928192919301931193219331934193519361937193819391940194119421943194419451946194719481949195019511952195319541955195619571958195919601961196219631964196519661967196819691970197119721973197419751976197719781979198019811982198319841985198619871988198919901991199219931994199519961997199819992000200120022003200420052006200720082009201020112012201320142015201620172018201920202021202220232024202520262027202820292030203120322033203420352036203720382039204020412042204320442045204620472048204920502051205220532054205520562057205820592060206120622063206420652066206720682069207020712072207320742075207620772078207920802081208220832084208520862087208820892090209120922093209420952096209720982099210021012102210321042105210621072108210921102111211221132114211521162117211821192120212121222123212421252126212721282129213021312132213321342135213621372138213921402141214221432144214521462147214821492150215121522153215421552156215721582159216021612162216321642165216621672168216921702171217221732174217521762177217821792180218121822183218421852186218721882189219021912192219321942195219621972198219922002201220222032204220522062207220822092210221122122213221422152216221722182219222022212222222322242225222622272228222922302231223222332234223522362237223822392240224122422243224422452246224722482249225022512252225322542255225622572258225922602261226222632264226522662267226822692270227122722273227422752276227722782279228022812282228322842285228622872288228922902291229222932294229522962297229822992300230123022303230423052306230723082309231023112312231323142315231623172318231923202321232223232324232523262327232823292330233123322333233423352336233723382339234023412342234323442345234623472348234923502351235223532354235523562357235823592360236123622363236423652366236723682369237023712372237323742375237623772378237923802381238223832384238523862387238823892390239123922393239423952396239723982399240024012402240324042405240624072408240924102411241224132414241524162417241824192420242124222423242424252426242724282429243024312432243324342435243624372438243924402441244224432444244524462447244824492450245124522453245424552456245724582459246024612462246324642465246624672468246924702471247224732474247524762477247824792480248124822483248424852486248724882489249024912492249324942495249624972498249925002501250225032504250525062507250825092510251125122513251425152516251725182519252025212522252325242525252625272528252925302531253225332534253525362537253825392540254125422543254425452546254725482549255025512552255325542555255625572558255925602561256225632564256525662567256825692570257125722573257425752576257725782579258025812582258325842585258625872588258925902591259225932594259525962597259825992600260126022603260426052606260726082609261026112612261326142615261626172618261926202621262226232624262526262627262826292630263126322633263426352636263726382639264026412642264326442645264626472648264926502651265226532654265526562657265826592660266126622663266426652666266726682669267026712672267326742675267626772678267926802681268226832684268526862687268826892690269126922693269426952696269726982699270027012702270327042705270627072708270927102711271227132714271527162717271827192720272127222723272427252726272727282729273027312732273327342735273627372738273927402741274227432744274527462747274827492750275127522753275427552756275727582759276027612762276327642765276627672768276927702771277227732774277527762777277827792780278127822783278427852786278727882789279027912792279327942795279627972798279928002801280228032804280528062807280828092810281128122813281428152816281728182819282028212822282328242825282628272828282928302831283228332834283528362837283828392840284128422843284428452846284728482849285028512852285328542855285628572858285928602861286228632864286528662867286828692870287128722873287428752876287728782879288028812882288328842885288628872888288928902891289228932894289528962897289828992900290129022903290429052906290729082909291029112912291329142915291629172918291929202921292229232924292529262927292829292930293129322933293429352936293729382939294029412942294329442945294629472948294929502951295229532954295529562957295829592960296129622963296429652966296729682969297029712972297329742975297629772978297929802981298229832984298529862987298829892990299129922993299429952996299729982999300030013002300330043005300630073008300930103011301230133014301530163017301830193020302130223023302430253026302730283029303030313032303330343035303630373038303930403041304230433044304530463047304830493050305130523053305430553056305730583059306030613062306330643065306630673068306930703071307230733074307530763077307830793080308130823083308430853086308730883089309030913092309330943095309630973098309931003101310231033104310531063107310831093110311131123113311431153116311731183119312031213122312331243125312631273128312931303131313231333134313531363137313831393140314131423143314431453146314731483149315031513152315331543155315631573158315931603161316231633164316531663167316831693170317131723173317431753176317731783179318031813182318331843185318631873188318931903191319231933194319531963197319831993200320132023203320432053206320732083209321032113212321332143215321632173218321932203221322232233223432253226322732283229323032313232323332343235323632373238323932403241324232433244324532463247324832493250325132523253325432553256325732583259326032613262326332643265326632673268326932703271327232733274327532763277327832793280328132823283328432853286328732883289329032913292329332943295329632973298329933003301330233033304330533063307330833093310331133123313331433153316331733183

1 18. A server configured to download information to a client, the information
2 including a set of instructions, the instructions for execution by a processor of the client,
3 the set of instructions causing the processor to perform a method, the method
4 comprising:

5 receiving a line of text, the line of text having a set of ordered characters;
6 flipping the characters of the line of text about a display axis;
7 identifying a set of runs of foreign characters in the line of text; and
8 flipping the characters of the runs of the set of runs of foreign characters within
9 each run of foreign characters.

1 19. The server of claim 18 wherein the set of instructions cause the processor to
2 perform the method further comprising:

3 receiving a block of text;
4 breaking the block of text into a set of lines of text; and
5 performing the receiving the line of text, flipping the characters of the line,
6 identifying and flipping the characters of the runs for each line of text of the set of lines
7 of text.

1 20. The server of claim 19 wherein the set of instructions cause the processor to
2 perform the method further comprising:

3 passing the line of text to a native operating system for display.

1 21. The server of claim 20 wherein the client is a remote mobile device.

1 22. The server of claim 20 wherein the client is a wireless device.

1 23. A method comprising:

2 receiving a line of text, the line of text having a set of ordered characters;

3 generating a set of runs within the line of text;

4 flipping a location and an orientation of each run of the set of runs about an axis
5 of a display; and

6 identifying a set of runs of foreign characters within the line of text.

1 24. The method of claim 23 further comprising:

2 flipping the orientation of each run of foreign characters within the run of foreign
3 characters.

1 25. The method of claim 23 further comprising:

2 rendering each run of the set of runs, except for the runs of foreign characters, in
3 a first orientation; and

4 rendering each run of foreign characters in a second orientation.

1 26. The method of claim 25 further comprising:
2 receiving a block of text having a set of ordered characters and a location; and
3 breaking the block of text into a set of lines of text, each line having a set of
4 ordered characters and a location.

1 27. The method of claim 26 wherein:
2 the text is received from an application with no capability of handling bi-
3 directional text.

1 28. The method of claim 27 wherein:
2 the foreign text is defined as text which should be displayed in a left-to-right
3 fashion.

1 29. The method of claim 27 wherein:
2 the foreign text is defined as text which should be displayed in a right-to-left
3 fashion.

1 30. A machine-readable medium embodying instructions, which, when executed
2 by a processor, cause the processor to perform a method, the method comprising:
3 receiving a line of text, the line of text having a set of ordered characters;
4 generating a set of runs within the line of text;
5 flipping a location and an orientation of each run of the set of runs about an axis
6 of a display; and
7 identifying a set of runs of foreign characters within the line of text.

1 31. The machine readable medium of claim 30 further embodying instructions
2 which when executed by a processor, cause the processor to perform the method
3 further comprising:
4 flipping the orientation of each run of foreign characters within the run of foreign
5 characters.

1 32. The machine readable medium of claim 30 further embodying instructions
2 which when executed by a processor, cause the processor to perform the method
3 further comprising:
4 rendering each run of the set of runs, except for the runs of foreign characters, in
5 a first orientation; and
6 rendering each run of foreign characters in a second orientation.

1 33. The machine readable medium of claim 32 further embodying instructions
2 which when executed by a processor, cause the processor to perform the method
3 further comprising:
4 receiving a block of text having a set of ordered characters and a location; and
5 breaking the block of text into a set of lines of text, each line having a set of
6 ordered characters and a location.

1 34. A processor which executes instructions causing the processor to perform
2 the method comprising:
3 receiving a line of text, the line of text having a set of ordered characters;
4 generating a set of runs within the line of text;
5 flipping a location and an orientation of each run of the set of runs about an axis
6 of a display; and
7 identifying a set of runs of foreign characters within the line of text.

1 35. The processor of claim 34 wherein the method further comprises:
2 flipping the orientation of each run of foreign characters within the run of foreign
3 characters.

1 36. The processor of claim 34 wherein the method further comprises:
2 rendering each run of the set of runs, except for the runs of foreign characters, in
3 a first orientation; and
4 rendering each run of foreign characters in a second orientation.

1 37. The processor of claim 36 wherein the method further comprises:
2 receiving a block of text having a set of ordered characters and a location; and
3 breaking the block of text into a set of lines of text, each line having a set of
4 ordered characters and a location.

1 38. A server configured to send instructions to a remote client, to configure the
2 remote client to perform the method comprising:
3 receiving a line of text, the line of text having a set of ordered characters;
4 generating a set of runs within the line of text;
5 flipping a location and an orientation of each run of the set of runs about an axis
6 of a display; and
7 identifying a set of runs of foreign characters within the line of text.

1 39. The server of claim 38 wherein the server is configured to send instructions
2 to the client to configure the client to perform the method further comprising:
3 flipping the orientation of each run of foreign characters within the run of foreign
4 characters.

1 40. The server of claim 38 wherein the server is configured to send instructions
2 to the client to configure the client to perform the method further comprising:
3 rendering each run of the set of runs, except for the runs of foreign characters, in
4 a first orientation; and
5 rendering each run of foreign characters in a second orientation.

1 41. The server of claim 40 wherein the server is configured to send instructions
2 to the client to configure the client to perform the method further comprising:
3 receiving a block of text having a set of ordered characters and a location; and
4 breaking the block of text into a set of lines of text, each line having a set of
5 ordered characters and a location.

1 42. The server of claim 41 wherein the client is a remote mobile device.

1 43. The server of claim 41 wherein the client is a wireless device.

1 44. A server configured to download information to a client, the information
2 including a set of instructions, the instructions for execution by a processor of the client,
3 the set of instructions causing the processor to perform a method, the method
4 comprising:
5 receiving a line of text, the line of text having a set of ordered characters;
6 generating a set of runs within the line of text;
7 flipping a location and an orientation of each run of the set of runs about an axis
8 of a display; and
9 identifying a set of runs of foreign characters within the line of text.

1 45. The server of claim 44 wherein the set of instructions cause the processor to
2 perform the method further comprising:
3 flipping the orientation of each run of foreign characters within the run of foreign
4 characters.

1 46. The server of claim 44 wherein the set of instructions cause the processor to
2 perform the method further comprising:
3 rendering each run of the set of runs, except for the runs of foreign characters, in
4 a first orientation; and
5 rendering each run of foreign characters in a second orientation.

1 47. The server of claim 46 wherein the set of instructions cause the processor to
2 perform the method further comprising:

3 receiving a block of text having a set of ordered characters and a location; and
4 breaking the block of text into a set of lines of text, each line having a set of
5 ordered characters and a location.

1 48. The server of claim 47 wherein the client is a remote mobile device.

1 49. The server of claim 47 wherein the client is a wireless device.

1 50. A method comprising:
2 receiving a line of text, the line of text having a set of ordered characters;
3 flipping the characters of the line of text within the line of text about a center
4 vertical axis of a display;
5 identifying a set of runs of foreign characters in the line of text; and
6 flipping the characters within each run of foreign characters about a center
7 vertical axis of each run of foreign characters.

